MSHA's Accident Prevention Program
Safety Idea

SAFETY IS A VALUE!

"Pump Monitoring"

Category : General Safety
Mine Type: All Mines

Two almost identical accidents occurred where pumps have exploded: one in 1994, a non-injury accident and the other in 2002 that resulted in a fatality. The accident in 1994 resulted in damage to stoppings in the underground mine and the forces from this explosion could be felt more than 800 feet from the pump. The accident in 1994 could easily have resulted in a fatality if someone had been nearby. In both accidents, the pump was not monitored to guard against material flow becoming restricted. When the inlet and or discharge lines to a pump become plugged, the pump will heat up, internal pressure increases and the pump will eventually explode.

Several devices are readily available to eliminate this potential hazard. These devices should be installed with the help of a qualified pump control technician. Contact the pump manufacturer or distributor for additional information on motor and flow safety controls.

1. Thermal sensing devices can be installed to measure the temperature of the liquid in the pump volute. A lower warning temperature and an automatic pump shut down temperature can be programmed in this type of controller. The American Society of Mechanical Engineers (ASME) requires two temperature sensors, one primary and one backup, when used in this manner. Other types of these devices can be attached to the pump without drilling or tapping.

2. Motor current sensing devices can be installed in the system which alert and automatically shut down the pump whenever the motor amps drop below the expected operating range for any critical period of time. Pump motor amperage drops when the pump ceases to pump material, indicating a system problem.

3.Flow sensing devices can be installed which automatically shut down the pump if flow stops for any critical period of time. These devices can be simple paddle switches in a clean fluid such as well water or they may be more sophisticated devices which do not come in contact with the fluid such as magnetic flow meters for aggressive fluids such as slurries.

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Remember – Safety is a Value that you can LIVE with!